REMARKS

Status of Application

Claims 1-8 and 10-20 are pending in the application; the status of the claims is as follows:

Claims 1-8, 10-18, and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,184,940 B1 to Sano ("Sano") in view of U.S. Patent No. 6,191,408 B1 to Shinotsuka et al. ("Shinotsuka") and U.S. Patent No. 6,995,791 B2 to Skow ("Skow").

Claim 19 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Sano in view of Shinotsuka and Skow as applied to claim 18 above, and further in view of U.S. Patent No. 6,972,800 B2 to Sano et al. ("Sano et al.").

35 U.S.C. § 103(a) Rejections

The rejection of claims 1-8, 10-18, and 20 under 35 U.S.C. § 103(a), as being unpatentable over Sano in view of Shinotsuka and Skow, is respectfully traversed based on the following.

Claim 1 recites:

An image-sensing apparatus comprising:
a solid-state image sensor including:
a plurality of pixels that perform photoelectric conversion so as to generate output signals that vary with a first characteristic in a first region such that the output signals vary linearly with respect to an amount of incident light and with a second characteristic in a second region such that the output signals vary logarithmically with respect to the amount of incident light; and
a plurality of types of color filters provided in vicinity of the pixels; and
a white balance circuit that performs white balance processing by performing, on at least one of different types of chrominance signals outputted as corresponding to the different types of color filters from the solid-state

> image sensor, different calculation operations fit respectively for the first and second characteristics in the first and second regions so as to thereby generate new output data.

Thus, claim 1 requires performing different white balance processing on signals that vary linearly with incident light relative to signals that vary logarithmically with incident light.

The Office Action dated July 11, 2008 (the "Office Action") notes that Sano discloses white balance processing by performing different calculation operations depending upon whether the data has first or second characteristics in corresponding first or second regions. A review of Sano shows that the first and second characteristics are based upon long and short integration times, with bright and dark regions receiving short and long integration times, respectively. *See* Sano 2:27-55 and 3:17-30. As noted in the Office Action, Sano does not disclose linearly and logarithmically varying signals, only long and short integration time signals producing linear signals. *See* Office Action page 3. While Sano discloses white balance processing by performing different operations depending upon first or second characteristics, the white balance processing is always done on linear data. As will be readily appreciated by the examiner, the result of multiplying linear data by a white balance correction gain factor will produce radically different results than multiplying logarithmic data by a white balance correction gain factor. *See* Sano 5:20-55. As an example, multiplying the linear factor of 2 by a gain factor of 1.2, results in 2.4, an increase in brightness of 20%:

$$(2.4-2.0)/2.0 = 0.2, \text{ i.e., } 20\%$$

In stark contrast, multiplying the logarithmic factor of 2 by a gain factor of 1.2, again results in 2.4, but this corresponds to an increase in brightness of 151%, more than twice as bright:

$$(10^{2.4}-10^{2})/\ 10^{2} = 1.51, \text{ i.e., } 151\%$$

Because the simple gain factor technique disclosed by Sano will produce such unpredictable results on logarithmic data, Sano does not disclose or suggest a white balance process compatible with both linear and logarithmic signals as required by claim 1. Thus, Sano does not disclose or suggest the white balance circuit claimed in claim 1.

Similarly, neither Shinotsuka nor Skow discloses a white balance process that is compatible with both linear and logarithmic signals. In particular, Shinotsuka does not disclose white balance processing of any type, and thus cannot disclose or suggest a white balance circuit compatible with both linear and logarithmic signals. Further, while Skow discloses a white balance process, it provides no indication that it would be compatible with both linear and logarithmic signals. In summary, Sano, Shinotsuka, and Skow, individually and collectively, do not disclose or suggest a white balance circuit that performs white balance processing on both linear and logarithmic signals. As claim 1 requires "a white balance circuit that performs white balance processing by performing . . . different calculation operations fit respectively for the first and second characteristics in the first and second regions so as to thereby generate new output data," the combination of Sano, Shinotsuka, and Skow cannot render claim 1 obvious. Claims 2-6 depend from claim 1. As the combination of Sano, Shinotsuka, and Skow fails to render obvious claim 1, claims 2-6 are non-obvious due at least to their dependence from non-obvious claim 1.

Claim 7, like claim 1, requires a white balance circuit. However, the white balance circuit of claim 7 employs a first look-up table that "provides, as output data, signal levels that are corrected, relative to levels of input chrominance signals, for deviations among the different types of chrominance signals in such a way as to correspond to the first and second regions." In other words, claim 7 requires a white balance circuit that performs white balancing on first region (linear) signals and second region (logarithmic) signals. As shown above, the combination of Sano, Shinotsuka, and Skow cannot render claim 7 obvious due to the required handling of both linear and logarithmic signals. Claims 8 and 10-17 depend from claim 7. As the combination of Sano, Shinotsuka, and Skow fails to render obvious claim 7, claims 8 and 10-17 are non-obvious due at least to their dependence from non-obvious claim 7.

Claim 18 requires photoelectric conversion in which the output signals in different regions vary linearly or logarithmically with respect to the amount of incident light. Further, claim 18, like claims 1 and 7, also requires a white balance circuit. Similar to claim 7, the

white balance circuit of claim 18 has "a look-up table in which is stored information with which to adjust a white balance among different types of chrominance signals outputted as corresponding to the different types of color filters from the solid-state image sensor." In other words, claim 18 requires a white balance circuit that performs white balancing on outputted chrominance signals that vary either linearly or logarithmically depending upon the region. As shown above, the combination of Sano, Shinotsuka, and Skow cannot render claim 18 obvious due to the required handling of both linear and logarithmic signals. Claim 20 depends from claim 18. As the combination of Sano, Shinotsuka, and Skow fails to render obvious claim 18, claim 20 is non-obvious due at least to its dependence from non-obvious claim 18.

Accordingly, it is respectfully requested that the rejection of claims 1-8, 10-18, and 20 under 35 U.S.C. § 103(a) as being unpatentable over Sano in view of Shinotsuka and Skow, be reconsidered and withdrawn.

The rejection of claim 19 under 35 U.S.C. § 103(a), as being unpatentable over Sano in view of Shinotsuka and Skow as applied to claim 18 above, and further in view of Sano et al., is respectfully traversed based on the following.

Claim 19 depends from claim 18, which was shown above to be non-obvious over the combination of Sano, Shinotsuka, and Skow. The addition of Sano et al. fails to this combination fails to overcome this deficiency. In particular, Sano et al., like each of Sano, Shinotsuka, and Skow, fails to disclose a white balance correction circuit adapted to handle both linearly and logarithmically varying signals. In fact, Sano et al. is completely silent with respect to any type of white balance correction and as such cannot disclose a white balance circuit for white balancing both linear and logarithmic signals. Thus, the combination of Sano, Shinotsuka, Skow, and Sano et al. fails to disclose or suggest at least the white balance circuit required by claim 18. As the combination of Sano, Shinotsuka, Skow, and Sano et al. fails to render obvious claim 18, claim 19 is non-obvious due at least to its dependence from non-obvious claim 18.

Accordingly, it is respectfully requested that the rejection of claim 19 under 35 U.S.C. § 103(a) as being unpatentable over Sano in view of Shinotsuka and Skow as applied to claim 18 above, and further in view of Sano et al., be reconsidered and withdrawn.

CONCLUSION

Wherefore, in view of the foregoing remarks, this application is considered to be in condition for allowance, and an early reconsideration and a Notice of Allowance are earnestly solicited.

If an extension of time is required to enable this document to be timely filed and there is no separate Petition for Extension of Time filed herewith, this document is to be construed as also constituting a Petition for Extension of Time Under 37 C.F.R. § 1.136(a) for a period of time sufficient to enable this document to be timely filed.

Any other fee required for such Petition for Extension of Time and any other fee required by this document pursuant to 37 C.F.R. §§ 1.16 and 1.17, other than the issue fee, and not submitted herewith should be charged to Sidley Austin LLP Deposit Account No. 18-1260. Any refund should be credited to the same account.

Respectfully submitted,

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